DOCUMENT RESUME

ED 034 794 TE 499 900

TITLE	Art Teaching Guides: Constructing with Wood and Other Materials, Kindergarten-Grade 6. Curriculum Bulletin No. 8b, 1968-69 Series.
INSTITUTION	New York City Board of Education, Brooklyn, N.Y. Bureau of Curriculum Development.
PUB DATE	69
NOTE	22p.
AVAILABLE FROM	Board of Education of the City of New York, Publications Sales Office, 110 Livingston Street, Brooklyn, New York 11201 ($1.00). Checks should be made payable to: Auditor, Board of Education
EDRS PRICE	EDRS Price MF-$0.25 HC Not Available from EDRS.
DESCRIPTORS	Art, *Art Activities, Art Appreciation, *Art Education, Art Materials, Creative Art, *Curriculum Guides, *Elementary Education, Handicrafts, Student Evaluation, Student Motivation, Teaching Techniques, *Woodworking

ABSTRACT

This teaching guide on working with wood suggests methods to introduce young children to experimentation with ready-cut preformed wood pieces, to instruct third and fourth grade children in handling tools and constructing wooden objects, and to direct fifth and sixth grade children in designing more advanced and imagainative projects. For each grade (K-6), information is provided on (1) materials and equipment, (2) the organization and placement of these materials, (3) the teacher's techniques for motivation and guidance, (4) the child's activities, and (5) evaluations by the teacher and the child. (JM)

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CURRICULUM BULLETIN • 1968-69 SERIES • NO. 8b

ED034794

ART TEACHING GUIDES

Constructing with Wood and Other Materials

Kindergarten-Grade 6

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BUREAU OF CURRICULUM DEVELOPMENT
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FOREWORD

This is one of a series of teaching guides planned to give teachers and supervisors practical help in the implementation of important areas of instruction suggested in the curriculum bulletin *Art in the Elementary School.* (Curriculum Bulletin No. 8, 1963–64 Series).

The guides have been designed to include suggestions for teaching a particular subject over a span of several grades. As a result, a teacher can use the instructional suggestions in a flexible way in accordance with the curriculum needs of the pupils in the class.

SEELIG LESTER
Deputy Superintendent of Schools

June 1968

ACKNOWLEDGMENTS

This curriculum bulletin, one in a series of eight *Art Teaching Guides* which present art experiences for children in kindergarten through grade 6, was prepared by the Bureau of Curriculum Development as part of its curriculum workshop program. These guides were produced under the direction of Helene M. Lloyd and William H. Bristow, Assistant Superintendents, and David A. Abramson, Acting Director, Bureau of Curriculum Development. Seelig Lester, Deputy Superintendent of Schools, was responsible for overall supervision of the program.

Developed as the result of research and evaluation by the supervisory staff of the Art Bureau, these bulletins were written under the guidance of Olive L. Riley, Director of Art, with the special assistance of Marian V. Dock and Beatrice Matthews, Art Supervisors, and George Kaye, Acting Director of Art.

Editorial preparation was supervised by Aaron N. Slotkin, Editor, Bureau of Curriculum Development. Lillian B. Amdur edited the manuscripts, and Simon Shulman was responsible for the overall design, page layout, and cover. Patricia M. Callahan, Curriculum Coordinator, coordinated the project.

KINDERGARTEN – GRADE 2

Most of the art materials with which the young child experiments and designs are pliable and lend themselves readily to free movement and manipulation. Wood, however, being hard, offers a resistance and a somewhat different challenge. Since it cannot be easily manipulated to change its size and shape, the young child will work more creatively in the earliest stages by using preformed and found wood materials. As a further development he may create forms that require basic manual skill in the use of tools, such as saw and hammer, and some individual planning before he begins to construct.

The first step is to permit the young child to look, handle, and feel in order to become acquainted with the various kinds of wood and related materials. Initial experiences are simply selection and combination. Working freely and experimentally, the child moves pieces about, placing them on top of, through, or next to others in temporary groupings. When he arrives at a pleasant arrangement, he joins the parts permanently with an all-purpose glue.

Through handling and simple assembling, he gradually senses variations in solidity, volume, and structural nature. He begins to sense problems of construction to be met and solved.

The young child loves to learn how to use tools. Often when he uses a hammer for the first time, he gets so much delight from the physical activity alone that he is content to do nothing but hammer nails into a block of soft wood. Even here, though, the teacher can encourage the child to create an interesting design by using nails of varying lengths, spacing them in rows, groupings, or at random on a shape of wood on which he may have previously painted a free design.

Young children will combine pieces of wood, much as they build with blocks, piling or lining up shapes in trial arrangements. In these early experiences, the children should not be asked to name their constructions. When children have had experience in creating nonrealistic arrangements, they may be encouraged to discover in them a likeness to some familiar object. After a discussion with the teacher about original ways in which they may clarify or dramatize the resemblance, the children change or add to their designs.

After they have made nonrealistic arrangements, some children may want to make planned constructions of simple toys or other recognizable objects. To make these more attractive, they may wish to use paint which will cover differences in wood color and give "oneness" to their designs. Since they will find that the paint drips and runs from one surface to another, children should be advised to limit the colors. Water-base flat paints are desirable since they give a more pleasing finish than shiny enamels which are, in addition, very hard to clean up.

The nature of the activity makes it advisable that only a few children share materials, tools, and work space at one time. Groups may be rotated so that each child may have the opportunity to gain experience in this area.

MATERIALS AND EQUIPMENT

The assortment of material suitable for the young child consists chiefly of ready-cut, preformed pieces of wood, such as shop cut-offs, large beads, popsicle sticks, tongue depressors, clothespins, narrow splints, 2" and 4" disks, and parts from old toys. Short lengths of narrow, smooth, wooden strips,

moldings, dowel sticks, and other pieces can be added to the woodbox when the child can use a small handsaw to cut them to desired lengths. The degree of hardness varies with different woods. In his later experiences the young child should use only the softer ones, such as pine, poplar, and basswood. When he is ready to use a saw and hammer, the teacher will need to give him specific instructions in using them properly for safety and purpose.

Many of the materials for wood construction may be obtained from school stock. Wooden cores, tubes, buttons, small boxes, spindles, picnic spoons and forks that are discarded at home may be brought in.

Other materials that suggest a relationship to wood through their qualities of texture, rigidity, or semirigidity may be added to the collection after the child has had some experiences in working with simple wooden shapes. These may include corks, small plastic containers and strips, large wire hairpins, coated wire, and jar caps that can be pierced for attaching.

The following tools and materials are essential in the kindergarten, first, and second grades: white polyethylene glue; 7 oz. claw hammer; handsaw with 12" blade; nails #12 gauge, flat head, and others in a variety of sizes; fine sandpaper cut into 3" squares; iron "C" clamp, with 4" or 5" opening; counter brush; and dust pan. Either a low, regulation workbench equipped with a vise, or a low, heavy table to the top of which a large "C" clamp can be fastened is essential. This enables the child to hold steady either thin lengths of soft wood to be sawed or other pieces to be nailed.

ORGANIZATION AND PLACEMENT

Organization of materials, tools, and work space should be planned so that children may work with safety, preferably in a designated area of the classroom. Tools should be kept in a subdivided covered box or on the inside panel of a closet door and be made available only under teacher supervision and after specific instruction in their use.

White polyethylene glue that comes in a paste pen with a spreader stick cap (G-1 List, Art section) is highly desirable for little children to use. This same kind of glue also comes in large plastic bottles too large for most little hands to hold. It can be poured into small plastic coffee-measuring cups and applied with paste brushes or popsicle sticks.

Wood and related materials can be selected more easily if stored according to kind in separate labeled boxes, transparent plastic bags, or sturdy trays that facilitate easy selection.

Care in handling tools and materials and the responsibility for returning them to their proper places, as well as sharing in the cleanup, are all important parts of the activity.

MOTIVATION AND GUIDANCE	ACTIVITIES
Teacher Says	**Child Does**
We have these materials to work with—some long and short nails, some wooden beads, buttons, and other forms that have holes through them, tools, and these flat pieces of wood on which you have already painted some pretty designs.	The child looks at and handles the materials to see what he will be working with.
Who knows what this tool is? (Teacher holds up a hammer.) What is it used for? Where have you seen one used? Have you ever used one? Why do you have to be careful when you use it?	He learns the use of a hammer and why he must be careful in using it.
This is the way you hold a hammer to put a nail in wood. This is how you guide a nail so that you can drive it in straight.	Watching the teacher hammer a nail in wood, he learns to hold the hammer tightly below the center of the handle to get the proper leverage. He observes how to hold the

MOTIVATION AND GUIDANCE

Teacher Says

ACTIVITES

Child Does

nail and tap it lightly to make it stand up in the wood. He learns that he must remove his hand from the nail as he gives it a few hard blows to drive it in the depth he wants.

Would you like to see how straight you can drive some nails into the piece you painted? You can make your piece more interesting if you attach some of the beads and other perforated forms with nails of different lengths. Put them in the design at places where they will look well with the colors and shapes painted on your large piece.

From the assortment of beads, buttons, disks, and other pierced wooden forms, the child selects a few, along with some nails of varying lengths. Making use of his observations, he nails the small forms in orderly or random arrangements to the colored areas of his painted shapes.

EVALUATION

NOTE: It must be understood that some form of evaluation, either individual or group, should be a part of every lesson. Typical evaluation questions follow.

By the Teacher

Does the child show skill in using woodworking tools?

Does he show some originality in combining materials?

Is he showing cooperation in sharing tools and materials?

With the Child

Which piece shows that the boy or girl can use the tools properly?

Where do you see woodwork that is very different from the others?

Which construction do you like very much? Why?

GRADE 1

MOTIVATION AND GUIDANCE

Teacher Says

Look at all the nice smooth wooden shapes we have here. Do you know what some of them are? (Tongue depressors, clothespins, thin splints; squares, rectangles, cylinders of wood.) Which ones look like some of the blocks you have played with? Do you think you can build with these pieces too? Choose a few pieces that are not alike and see what you can do.

As you experiment you are discovering that some pieces don't stand by themselves and need to be fastened to others. Do you think you can use this sticky tape to hold them in place for a few minutes while you see how they look?

Do you try each piece in several different places in your construction before you find the spot where you think it looks best? How does your arrangement look when you turn it around and look at it from all sides? You can see only one side of a picture, the front. But you can see also the back and sides of the things you build with blocks or wood.

ACTIVITIES

Child Does

The child identifies by name the wooden shapes that he knows. He recognizes the similarity between some of the blocklike pieces and the toy blocks. He begins to assemble the various pieces, placing them next to, touching, and on top of one another. He discovers that he must place the larger pieces lower than the smaller, lighter ones.

At this stage he uses a double-faced adhesive tape to fasten temporarily the smaller, lightweight pieces to others in his arrangement so that he can see how they look before using glue or nails.

He experiments with his pieces–grouping and regrouping them until he is satisfied with their placement. As he works he turns his arrangement around to view it from all sides.

He realizes the problems in designing in three dimensions as compared with those in drawing and painting.

MOTIVATION AND GUIDANCE

Teacher Says

When you like the way your construction looks, you can use nails or this glue to fasten the parts together permanently. When you use a hammer, hold it tightly below the center of the handle, like this. Hold the nail and tap it lightly to make it stand upright in the wood. Then let go of the nail and hit it squarely on the head until you drive it all the way in.

Your construction holds together while it stands on the table, but will it fall apart if you try to pick it up? Will it hold together better if you glue it on a large flat base?

Now that you have finished building your piece do you want to leave it unpainted or do you want to use one or more colors to decorate it? If you use several colors you plan them just as you do in your easel paintings. You will have to be careful to prevent the paint from running from one part to another. Must all sides of a single part be made the same color?

ACTIVITIES

Child Does

He selects nails that are long enough to join the pieces securely and yet not go through the other side of the second piece. When the pieces to be joined make it possible to do so, he hammers the nail through the first piece while it rests on the table. Then he puts it in place in his design and hammers the nail through the piece underneath.

The child tests the stability of his partially constructed arrangement and decides whether or not he needs to fasten it to a base.

Using tempera paints and 1/2" or 1/4" brushes, he paints the surfaces of his piece, making them all one color or alternating several colors to create a pleasing design. Sometimes he uses short strips of masking tape to cover an area that he wants to leave unpainted or to make a clean-cut edge. When the paint has dried, he removes the tape.

EVALUATION

NOTE: It must be understood that some form of evaluation, either individual or group, should be a part of every lesson. Typical evaluation questions follow.

By the Teacher

Does the child show ingenuity in combining the varied pieces of wood?

Does he show skill in using tools and materials?

When the child uses more than one color to finish his piece, does he show some sensitivity to pleasing color and design?

With the Child

Which piece shows an unusual combination of materials that look well together?

Where do you see an unusual way of fastening pieces together?

Which arrangement do you like best? Why?

GRADE 2

MOTIVATION AND GUIDANCE

Teacher Says

We've just received these nice long pieces of smooth wood of assorted widths and this bag of small ready-cut odds and ends of interesting wooden forms. Those of you who have already done some experimenting with wood and have used a saw can have fun creating with these new materials.

During our reading period you showed interest when we were talking about castles and also about how bridges are built. Do you think you can use some of these materials to construct a castle or a bridge? What are some of the things you will want to think about to make your structure castle- or bridge-like?

ACTIVITIES

Child Does

The child looks over and handles the assorted lengths of wood as well as the geometric and odd-shaped pieces. He senses which ones he can use in their present form and which ones he may need to cut to a desired size or shape.

To motivate individual ideas, the children have a lively discussion about the characteristics typical of their chosen structure and essential for its construction, such as the drawbridge and moat of a castle or the piers, cables, and ramps of a bridge. They visualize the possibilities for these features to be found in the varying shapes of wood and in their various combinations.

MOTIVATION AND GUIDANCE Teacher Says	ACTIVITIES Child Does
What are some of the differences in the appearance of a castle and this school building? How many towers or turrets will your castle have? What shape will they be? What will the entrance gateway be like?	
If you are constructing a bridge, what kind of supports will hold it up? What kind of approaches will you build at each end?	
When you decide which structure you are going to build, select a few long pieces and some ready-cut forms. Move them about, grouping them in different arrangements to try to plan a structure that suggests an interesting old castle or a sturdy new bridge.	From the assortment of materials the child selects a few lengths of wood and some large and small ready-cut forms, such as popsicle sticks, disks, dowel sticks, and cylindrical, rectangular, triangular, and wedge-shaped pieces. Before he cuts any piece to a desired size, he makes a trial arrangement to plan roughly what he would like to construct.
When you have some idea of how you are going to build your structure, cut the long pieces to the size you want. You will need to measure with a paper gauge and mark with a pencil the line on which you will saw. (Teacher demonstrates.)	Measuring the desired length with a paper gauge and using a ruler or another piece of wood as a guide, he draws a straight line on the length of wood to indicate where he will saw. Securing the piece tightly with a clamp or in a vise, he follows the teacher's directions for sawing it properly. After he cuts the piece, he smooths the rough edge with fine sandpaper.
To hold the piece steady while you saw, clamp it firmly to the tabletop or place it in this vise like this. (Teacher demonstrates how to use a saw properly.) Use sandpaper to smooth the rough edge.	
Try out several ways of grouping your various pieces. Before you nail or glue them permanently you can see how your design is going to look by joining the parts temporarily. Use this gummed tape that is very sticky on both sides.	Working freely and experimentally, the child puts his assorted pieces together in temporary groupings. He tests stacking, balancing, bridging, and other structural means. Temporarily he holds the parts in place with small pieces of double-faced gummed tape.
When you are pleased with your design, you can nail or glue the parts together. Remember what you have learned about using a hammer and nails safely.	The child decides which parts to join with an all-purpose glue and which ones he will be able to nail. He selects nails of the correct size and tries to hammer them in straight.
Will your structure look better if it is set on a base? How big and what shape will it be?	He sets his structure on pieces of various shapes and sizes and selects the one he likes best. He glues or nails it to his piece.
Will color add to the beauty of your design? Structures such as buildings and bridges are usually one or two basic colors with small amounts of additional colors used as trim or decoration. What colors do you want to use? You will find that it is better to paint wood with mixtures that are a little thicker than those you use for painting on paper.	From an assortment of spectrum tempera colors, and some light, dark, and intermediate ones mixed by the teacher, the child selects the few he wants. He uses 1", 1/2", and 1/4" brushes, reserving the narrow ones for details and hard-to-reach areas.

EVALUATION

NOTE: It must be understood that some form of evaluation, either individual or group, should be a part of every lesson. Typical evaluation questions follow.

By the Teacher

Is the child showing imagination in the structures he builds?

Is he able to do some preliminary planning and to carry out his ideas satisfactorily?

Is he gaining some awareness of pleasing proportions in form and color?

Does he have the manual skill expected of a second-grade child?

With the Child

In which structure has wood been used in an unusual way?

Which piece shows a skillful use of a saw and hammer?

Where do you find color that appeals to your?

Which structures do you like the best? Can you tell why?

GRADES 3 AND 4

A child's inventiveness grows as he experiments, designs, and constructs with wood and other materials. The hardness and resistance of wood offer a new challenge. The three-dimensional quality of the material, the variations in thickness, weight, texture, shape, and type stimulate interest and provide initial motivation for the child's experiments. Through handling and manipulating additional materials, he becomes aware of their solidity, volume, and structural nature.

The child's first experiments start when he selects from a variety of materials made available to him, senses their intrinsic qualities, and combines forms into trial arrangements. He becomes aware of problems to be met and solved: making his arrangement stand, grow, hold together, balance, present attractive contours, and effective patterns of light and dark. He may be led to consider the possibilities for enhancing his arrangement by contrasting smooth and textured surfaces, by painting it with one or two colors, and by introducing unifying elements, such as overlapping parts or repetitions of line.

He should be guided in the proper handling and use of specific tools. The teacher points out the practical need for holding a hammer firmly below the center of its handle, and for keeping his eye on the head of the nail while hammering in order to avoid hitting fingers. The proper and safe use of handsaws, clamps, and pliers, as well as the care of his tools must be stressed. Instruction in the use of glue, when nailing is impractical, should be given. Thinly coating surfaces to be joined, and keeping glued pieces under pressure until the adhesive has set, are useful learnings. The child should be guided in the use of the handsaw to cut wood to a desired length, along with directions for marking the piece first.

Children in the third and fourth grades begin to place greater value on the finished appearance of a product. They should be shown how to use sandpaper for smoothing rough edges and surfaces when they finish a wooden construction.

Through repeated experience in construction, the child gains greater control of materials, tools, and processes. His creativeness may be extended toward designing and constructing objects springing not only from imagination and fantasy but also from those that may have usefulness, such as ornaments, games, and toys that work or move.

Grade Four children who have already had preliminary experiences in constructing with wood may have developed greater manual skill in control of materials and tools, and may be more confident about constructing an object that carries out an imaginative idea and is also practical. From the store of materials the teacher and class have built up from the G-1 List and outside sources, children can be motivated to make constructions in keeping with a general theme developed for the whole class, with each child making his individual contribution. Joint projects may be developed, such as making toys to give to one another, constructing buildings for a city, village, or street, preparing floats for a holiday parade, making imaginative play furniture for children, building a playground with unusual play equipment, or portraying a scene from a story or play with appropriate characters and background. A collection of animals for a zoo, a remembered neighborhood industrial scene, a trainyard, an airport, or a favorite room or area in school or at home– all provide suitable material for motivation.

MATERIALS AND EQUIPMENT

A wide variety of materials in assorted sizes and shapes is desirable. The G-1 List provides short lengths of wood, disks, colored balls, sticks, and assorted ready-made wooden forms. Home, local lumberyards, carpenter shops, and neighborhood industrial plants may provide others. These may include clothespins, toothpicks, dowels, doorknobs, wheels, spools, picnic spoons and forks, bamboo sticks, driftwood, discarded toys, wooden cores, tubes, disks, spindles, and boxes.

Additional materials that offer possibilities for combinations may be introduced. These include corks, bolts, washers, wire coat hangers, wire screening, strips of metal foil, basket reeds, and plastic containers.

Colored string, wool, coated wire, and threads may be introduced to add linear elements. Transparent sheets or gelatins are useful in creating a feeling of lightness and in defining open areas within an arrangement.

Tools include hammers, saws, clamps, sandpaper, glue, and tempera paints.

ORGANIZATION AND PLACEMENT

It is important that the teacher plan the organization of materials, tools, and work space for construction activities so that the children may work safely within their designated area. A sense of responsibility is gradually built up as children come to realize the need for proper care of tools and equipment. The sharing of tools involves cooperation and respect for the rights of others.

A firm level height is needed in order to provide space for handling tools correctly and easily. Either a regulation workbench or sturdy table may be used.

Tools should be kept in divided boxes, or hung on the inside of closet doors, and should be made available only under teacher supervision and after specific instruction in their use.

Plastic containers, ice cube trays, and muffin tins provide good storage for nails, screws, and small items. Wood and related materials can be more easily selected if classified by shape, size, and type. Strong cartons of uniform size may be used for storing partially completed constructions.

Oil-base paints, shellacs, and solvents must be kept in metal cabinets because of fire hazard.

Rotating committees may be trained to check equipment after each session to see that materials are returned to the proper storage areas, that brushes are thoroughly cleaned, and that work is labeled for identification and carefully put away.

Small groups of children share materials, tools, and work space at one time. The groups should be rotated so that each child has the opportunity to gain experience in this field of design.

GRADE 3

Experimental Designing

MOTIVATION AND GUIDANCE	ACTIVITIES
Teacher Says	**Child Does**
Here are boxes containing different sizes and shapes of wood. You may select several shapes and sizes. See if you can put some pieces together and invent an interesting design.	Children select from boxes and trays available to them. They handle different pieces to get the feel of them, and to try different arrangements.

MOTIVATION AND GUIDANCE Teacher Says	ACTIVITIES Child Does
Look at your arrangement from all sides. Do you want it to grow upward or will it grow outward to form a flat arrangement?	Children study their constructions as they proceed, making changes in keeping with their judgments which the teacher invites.
Have you some open spaces to give it more interest? Is there a part that attracts your interest most? Is that part near the center?	Children remove or add pieces to provide for open and solid areas. Attention is engaged in the problem of giving the piece a center of attraction.
How can we make it permanent? Would nailing or gluing it be the best way to make it hold together?	Children use nails, hammer, and glue under teacher guidance, after they learn proper handling of these materials and tools.
This is how you hold the hammer and nail so that you will not hit your fingers.	
You spread glue very thin on both pieces to be joined and then use the clamp like this to hold pieces together until dry.	
When your design is finished, you may want to add color or texture by using other materials.	Children select from available paints small metal objects, brads, etc., to use as elements that will add interest.
Experiment with other materials to see if you can make it more interesting. You can imbed nails, scratch the surface, or sandpaper it to improve the design.	
Where do you put tools and materials so that they will be in good order to be used again?	Time is allowed for learning how to care for tools and how to store them properly.

Designing A Toy

MOTIVATION AND GUIDANCE Teacher Says	ACTIVITIES Child Does
Now that you've done some experimental designing with wood, you'll probably enjoy creating a wooden pull toy that will appeal to a young child. From this assortment of wooden forms and small pieces of wire, small plastic containers, corks, buttons, mesh, feathers, and other interesting items, what amusing figures or forms do you think you might construct?	While looking through and handling the assortment of challenging materials, the child talks spontaneously about fanciful suggestions that come to mind. Guided further by stimulating questions, his imagination is aroused. He visualizes make-believe animals, birds, and out-of-this-world people.
What could this large wooden bead be used for? Does this big red spool suggest some part of a figure? How could you use these thick, colorful pipe cleaners? What do some of these other materials suggest to you?	The same shape of wood, or other available material, will suggest different ideas to each child. Encouraged by the teacher's individual guidance, one child may use a large spool vertically to represent the head of a person, while another may use it horizontally as the body of a bird or animal.
You can enlarge some parts of the toy that would ordinarily be small. This kind of exaggeration may make your toy more amusing. What other funny things can you do to your toy that would amuse us?	Recalling the basic characteristics that are typical of an animate or inanimate form, the child exaggerates or reduces the size of some parts, changes their shape or interchanges features from one form to another for amusing effects.
What provisions will you make in your design so that the toy can be pulled or moved? Will you need a handle, a platform, wheels, runners? How will you make one of these additions an attractive feature of your design?	Using a dowel stick, a heavy cardboard rectangle, disks, bottle caps, or other appropriate material, he solves the problem of mobility.

MOTIVATION AND GUIDANCE Teacher Says	ACTIVITIES Child Does
How will you join parts securely so that the toy will withstand some wear? Remember that the skill you use in handling your tools and the accuracy you show in fitting pieces contribute to the beauty of your design.	The child uses glue, hammer and nails, cords or wires, and interlocking parts as a means of assembling pieces permanently. He smooths rough edges with sandpaper before joining pieces.
Color will make your toy more attractive. What do you want to use for this? Can you introduce other materials that lend a note of color?	Some children paste colorful paper shapes or strips on their completed toys; others paint parts or all of them with tempera or other water-base colors. Some use colored yarns, rickrack braid, feathers, buttons, beads, or similar materials as decorative elements.

EVALUATION

NOTE: It must be understood that some form of constructive evaluation, either individual or group, should be a part of every lesson. Typical evaluation questions follow.

By the Teacher	With the Child
Is the child showing some originality in combining materials?	Which piece grows upward in an interesting way? Point to the part that "moves" upward.
Does he show skill in manipulating tools and materials?	Where do you see a wood surface that has been given an interesting texture or pattern? How was it done?
Has he made use of open spaces to give interest to the design?	Which design is nailed so that it holds together firmly?
Does some part of his design attract more attention than others?	Which design looks as though it will be a useful toy? Why?

GRADE 4

Designing A Float For A Parade

MOTIVATION AND GUIDANCE Teacher Says	ACTIVITIES Child Does
Have you ever seen a parade where there were many floats, colorfully decorated?	The child discusses remembered experiences of parades and floats.
Can you tell the class about some of the floats you saw?	He describes parades with historic, patriotic, civic, and holiday motifs.
How were the floats built so that they would move when pulled? What arrangements were made for placing the decorative or scenic displays?	He tells of the need for wheels, flat areas for holding displays, and interesting arrangements of displays.
This class has studied our nation's history. You know about our holidays and what each one celebrates. How would you like to build a parade of holiday floats?	Holidays are named along with ideas for representing each one. The children have a lively discussion, imagining what their parade of floats might look like.
First we will think about the float itself. I will let each one experiment with pieces of wood. See what kind of movable float you can invent.	In keeping with the teacher's preplanned organization for distribution of materials, each child selects the pieces he will need for constructing his float.

Place your pieces together first, in many different ways, and see what you can invent that will look interesting and enable your float to move.

He experiments with different arrangements, making judgments to provide moveability. He also seeks to gain interest through variety in placement of masses, leaving open as well as closed areas.

When you have a pleasing arrangement, you will be ready to join it firmly. If you use nails, this is how to hold one properly and to hammer. If you use glue, this is the proper way to use it. (The teacher demonstrates the way to coat surfaces thinly, and how to use a clamp to hold the parts together until they are dry.)

He shows he knows how to hold and use tools as shown by the teacher.

Let's look at some of our pieces before they are finished, and see which have good joinings or good ideas. Can wire, paper, or other materials be added to carry your ideas even further?

He keeps evaluating his own as well as other pieces, making judgments to improve construction, joinings, color, and design elements.

If you have a particular holiday in mind, think of additional ways to make your float more appealing to those who will see it.

He may paint, sandpaper, add to, or take away from his constructions to give them the more "finished" look valued by children of this level.

When your designs are completed, let's place them in parade formation to see how they will look together.

The class joins in arranging floats in a parade so that the total design will look most effective.

Before we collect all our working materials, check to see that all things you have used are clean. Return each item to its proper place so that we can continue to have a good workroom.

Children are supervised in the important aspect of cleaning and caring for their tools, and returning them to proper places in the time allotted for this part of the activity. (If the lesson requires more than one session, pupils carefully place their labeled work in areas designated for storage, ready to be distributed for completion at another time.)

Constructing A Decorative Wall Panel

MOTIVATION AND GUIDANCE

Teacher Says

You have made wood constructions that stand. How would you like to make a nonrealistic one that can be hung on the wall as a decoration? Since this is a design that will be seen in an upright position, how will the problem of construction differ from previous ones you have done?

Will you want a background for your arrangement? What will you use? What shape will it be? Can you build your design within a ready-made shape?

Which of our available materials will look well together? Can you use some of them to create patterned or textured areas?

In what varied ways can you group similar or different materials? Consider how repetition of line and shape can bring a feeling of balance or oneness to your design. How will areas of varying depth affect your design?

ACTIVITIES

Child Does

The child, through discussion, begins to visualize what the problem is. He foresees the need for experimenting with varied pieces of wood and other materials in a horizontal arrangement even though the panel will finally be viewed from the front when displayed vertically.

He finds that he may construct a freely arranged assemblage either with or without a flat background or a boxlike frame. Some children make structures within small, sturdy, uncovered cardboard or wooden boxes.

He selects from ready-cut wooden forms, styrofoam shapes, found objects, cords, wires, nails, roundhead paper fasteners, and similar forms.

He tries out various ways of grouping by stacking, interlocking, bridging, overlapping, and inserting pieces of similar or different sizes and shapes. He strives for balance, unity, and dark and light areas in his designs.

MOTIVATION AND GUIDANCE

Teacher Says

How will you fasten together or attach pieces so that they project forward? How will you attach hard wood pieces, plastic forms, metal pieces, built-up sections?

What kind of finish will add to the beauty of your design? Keep in mind that your construction is a kind of sculpture and therefore should be simple in color.

ACTIVITIES

Child Does

Using nails, he joins soft pieces of wood that are not too thick and also attaches thin, pierced, metal forms. He finds it necessary to use glue for joining plastic forms and in pieces where nailing is not possible, such as in stacked groupings and interlocking parts.

Some children leave their pieces uncolored, preferring the natural colors and textures of the various materials. Others color their entire construction with one or two tempera or water-base flat paints.

EVALUATION

NOTE: It must be understood that some form of constructive evaluation should be a part of every lesson. Typical evaluation questions follow.

By the Teacher

Is the child combining pieces in a trite or a unique way?

Does he show evidence of increasing dexterity in handling tools and in assembling parts of his design?

Have any materials been used in a new, unusual way?

What means have been used to give a feeling of oneness to the design?

Where has the child gained interest in his design through variety in placement of masses? Through the use of open as well as closed areas?

Has he created interesting patterned or textured areas in his design for a wall panel?

With the Child

Which float is most unusual? What makes it different?

Which float is most expressive of the spirit or idea that we associate with the holiday for which it is designed?

Where have wheels or other motion-making devices become an interesting part of the entire design?

Where is the color especially pleasing?

What are the "eye-catching" features of your design?

Where do you see repetition of line in the wall panel design? Where do you see repetition of shape? How has a feeling for balance been achieved? Is there a feeling of oneness or unity in the design? How has this been accomplished?

GRADES 5 AND 6

As with the youngster in grades 3 and 4, there is marked continuance in a fifth- and sixth-grade child's inventiveness in designing and constructing in wood. The pupil is further challenged by the use of three-dimensional materials, with their varieties of forms, weights, and textures. These qualities provide stimulation for experiments based on his interests and manipulative abilities.

If the teacher finds that pupils have had few experiences in constructing with wood, it is suggested that initial experiences be simplified before introducing those that may be more complex. Suggestions may be found in the *Art Teaching Guides for Grades Three and Four.*

Initial experiences begin with the child's selections from a wide assortment of wooden forms. As he progresses, other materials are added to the collection. To join parts, the child may use those tools that best meet his individual needs. Careful guidance should be given in the safe handling and proper use of tools. For example, the child should be reminded to hold a hammer firmly below the center of its handle and to keep his eyes on the head of a nail when he is hammering to avoid hitting his fingers. The proper and safe use of handsaw, clamp, pliers, and hand drill should be demonstrated. The teacher can explain the use of clamps to exert pressure whenever pieces of wood are being joined by glue, and also can explain the need to sandpaper rough edges of wood.

Through repeated experiences, children gain greater control of materials, tools, and processes. Their ingenuity may be extended toward designing and constructing imaginative objects, and also ornaments, games, toys, and other workable forms.

At every stage and phase of the child's development in constructing with wood, the teacher should constantly guide his growth in ability to make art judgments. The teacher's questioning should relate to originality, color, texture, design, and craftsmanship.

MATERIALS AND EQUIPMENT

A wide variety of materials in assorted sizes and shapes is desirable. The G-1 List provides for the following items: short lengths of wood, disks, colored balls, sticks, and assorted ready-made wooden forms in various geometric shapes. Homes, local lumberyards, carpenter shops, and neighborhood industrial plants are sources for clothespins, toothpicks, dowels, wheels, spools, bamboo sticks, driftwood, tubes, spindles, boxes, balsa pieces, and other materials that relate to the construction at hand.

Following the child's initial experiences in working with simple wooden shapes and forms, new materials offering possibilities for more sensitive selections may be introduced. These materials should be related to wood through their qualities of texture, rigidity, or semirigidity. They may include plastics, corks, balls, washers, wire coat hangers, wire screening, strips of pliable metal foil, assorted industrial findings, discarded bits, and by-products which offer additional materials to challenge and stimulate imaginative construction.

Transparent sheets of gelatin and acetate, of different gauges and colors, provide attractive means for introducing elements of lightness and open areas within an arrangement.

When children can engage in more advanced work, it is necessary to teach correct procedures in the manipulation of pliers, snips, automatic spiral drill, and screwdriver. Each tool serves a specific function and may be damaged if used incorrectly. A selection of appropriate tools may be made from the G-1 List.

ORGANIZATION AND PLACEMENT

It is of the utmost importance that the teacher preplan the organization of materials and tools, along with work space, for all construction activities so that children may work safely within a designated area. A sense of responsibility is gradually built up as children come to realize the need for proper care of tools and equipment. Sharing tools involves cooperation and respect for the rights of others within a classroom climate.

It is important that a firm, level height and adequate space be provided so that tools may be used correctly, easily, and safely. Either a regulation workbench or a sturdy table is essential.

All tools should be kept in divided boxes and made available only under teacher supervision, after specific instruction in their use has been given.

Plastic containers, ice cube trays, and muffin tins provide good storage receptacles for nails, screws, and other small items. Wood and related materials can be easily selected if classified as to shape, size, and type and stored in separate boxes or baskets. Strong corrugated cartons of uniform size, labelled for identification, may be used for storing partially completed constructions.

Because of fire hazards, oil-base paints, shellacs, and inflammable solvents must be kept in metal cabinets.

Rotating committees may be trained to check equipment after each session to see that materials are returned to their proper storage areas, that brushes are thoroughly cleaned, and that pupils' projects are labelled for identification and carefully stored.

GRADE 5

Designing A Playground Structure

MOTIVATION AND GUIDANCE

Teacher Says

While developing our unit on Community Living, we have talked about the many possibilities for carrying out some of your ideas in projects constructed of wood and similar materials. We have now collected these cartons of wooden shapes, metal strips, thin wire, small plastic shapes and containers, sheets of colored plastic, wire mesh, and colored cords. Since you showed an interest in the new playground parks, you may want to select materials to design the equipment or structures on which you would enjoy playing or exercising.

What are some of the play and physical activities that other children from ages four through eleven might enjoy? What original ideas do you have for designing structures that can be used for these activities and that will encourage children to play on them?

From these cartons of wood and materials, select several pieces with which to try out your ideas.

Experiment with your selected pieces until you arrive at some construction that is new and different. As you work, consider some of the following modern structural features: prefabricated sections that can be combined in many ways;

ACTIVITIES

Child Does

The child looks through and handles some of the varied materials on hand. He talks about the basic playground forms and structures which he may redesign more imaginatively or create anew, but which will be suitable as equipment on which children can play and exercise. These may include platforms, poles, shelters, mazes, ladders see-saws, slides, swings, turntables, cages, or large, simple, stylized creatures on which to perch, climb, or "ride."

He selects pieces of wood in varied sizes and shapes, as well as additional linear or mass elements, that appeal to him.

He groups and regroups the basic pieces, making many changes as he explores the varied possibilities for his idea. While experimenting to see how assemblages look, he joins parts together temporarily by using strong, double-faced,

precast U-and V-shaped (concrete) pieces assembled to create nonrealistic structures; tubular elements that can become the foundation for a rigid frame; open-ended equipment with one section leading directly to a choice of others; attractive assemblages of simple geometric shapes; introduction of colorful and patterned elements into the design.

gummed tape. He constantly makes changes in selectivity and arrangement, removing or adding pieces to create open and solid areas. He introduces colored materials and creates patterned areas to add interest to some parts.

Study your construction from all sides. Do you think that each piece is placed where you feel it belongs? Is any part more important than others? Have you discovered a new way of joining pieces? Would the design of your structure be sufficiently sturdy to withstand vigorous daily use by active children? If not, how can you introduce some additional supports or structural framework without spoiling the basic design?

He studies his constructions as they develop, making improvements after discussion and medial evaluation. He judges the sturdiness of his designs and reinforces parts, considering appearance as well as function.

When you are satisfied with your design, glue or nail the parts together, removing the gummed tape from only a few joinings at a time. In this way you can reassemble the structure, bit by bit, and will not forget how to put it together again. Remember all the precautions we have learned about using a hammer, a saw, a drill, and other tools. Also, sandpaper any rough spots or edges before you join pieces together.

He removes the gummed tape, which temporarily holds his construction together, and joins the parts permanently. When using glue, he spreads it very thin on both surfaces to be joined, and then clamps them together until they are set. When the nature of the construction requires a screw rather than a nail, the child drills a small hole first to insert the screw before using a screwdriver to imbed it further.

If you want to make your construction more attractive, you may paint part or all of it.

With one or more tempera or water-base flat paints, he highlights some parts, or gives a oneness to his entire design by using a single color.

EVALUATION

NOTE: It must be understood that some form of constructive evaluation should be part of every lesson. Typical evaluation questions follow.

By the Teacher

Has the child met the objectives of pleasing design and practicality in his construction?

Has he designed a structure that will withstand rigorous and constant use?

Is there a "fun" element apparent in the proposed use of the structure?

Is the child's craftsmanship consistent with his maximum manual skill?

With the Child

On which one of these models for a structure would you like to play? Why does it appeal to you?

Which construction do you consider most pleasing in design and color? Why do you like it?

In what kind of setting or background do you think your model would look best?

Where have nails, screws, or glue been worked successfully into the design and not detracted from the general appearance of the structure?

GRADE 6

Designing An Imaginary Form

MOTIVATION AND GUIDANCE

Teacher Says

In looking through our box of wooden scraps and "found" pieces, I saw some shapes that stirred my imagination. I think you will also find them interesting. Here's an unusual shape. Does this suggest some part of an imaginary creature that might crawl, fly, or hop? Here's another odd piece. Does this stir your imagination? Could it become a part of an original vehicle that travels at great speed? What else might you add to it to complete your particular idea?

Let's discuss other possibilities. Each one in this group may select an important shape. Turn it around and look at it from all sides. What kind of creature or vehicle does it suggest to you? What else do you need to make your idea more recognizable?

Can you find some wooden pieces or other materials in these boxes that you may combine with your first important shapes in order to complete your idea? How can you use some of these to give a feeling of oneness to your design? Consider the part that open spaces play in bringing a feeling of light and dark or lightness and weight to your design.

While you are experimenting, you may use this double-faced, gummed tape to hold some parts together temporarily. When you have decided upon the final arrangement, you may nail, glue, screw, insert, wrap around, tie, or join parts in some other permanent way, while keeping in mind that the means for joining should not detract from the beauty of your work. Remember all the safety rules for handling tools. Return all tools to their regular storage places when you have finished with them.

You may decide upon the type of finish appropriate for your design. Can you create interesting textured effects with tools on some surfaces? Will it look better painted one or several colors, or when you leave it uncolored and apply wax or clear shellac? If you have used woods of various colors and finishes, a single color will unify the design.

ACTIVITIES

Child Does

The child listens while the teacher motivates the activity by holding up first one unusually shaped piece of wood and then another. He suggests imaginary creatures and vehicles for which the pieces may be used. He describes legs, wings, heads, tails, body shapes, and other parts which he visualizes as necessary additions for a general identification of the forms.

He selects one basic shape that appeals to him because he foresees some possibilities for creating an original form. He visualizes the additional characteristics essential to classify the form.

He selects additional wooden pieces and related materials, such as short lengths of cord, wire, colored yarn, plain or colored plastic forms and containers, pieces of wire mesh, strips of metal foil, corks, bolts, washers, and basket reeds. He uses these for creating linear or mass elements in his design.

Using small pieces of gummed tape, he joins parts of his assemblage temporarily so that he can view it from all sides. He adds or subtracts pieces to improve the quality of his design. Using hammer and nails, screwdriver and screws, polyethylene glue, or the natural-attaching qualities of the materials themselves, he permanently assembles his design.

He may roughen pieces or pattern some surfaces. If he thinks that color will enhance his design, he may use tempera or any other water-base flat paint. If he feels that the color and texture of the wood itself lend a quality of beauty to his work, he may leave it uncolored, and wax or shellac all or parts of it.

EVALUATION

NOTE: It must be understood that some form of constructive evaluation, either individual or group, should be a part of every lesson. Typical evaluation questions follow.

By the Teacher

How has the child met the challenge offered by interesting, odd-shaped pieces of wood and other materials at hand? What is unique about his construction?

Does his craftsmanship contribute to or detract from the quality of his design?

Has he dramatized some characteristic feature of his design which makes it more expressive or appealing? What kind of response does it evoke? Humor? Horror? Sorrow? Gentleness? Violence? Rapid movement?

With the Child

Which piece shows originality? What is unusual about it?

Is the design equally pleasing from the front, back, and all sides? If not, how might it be improved?

Does the finish in the piece seem appropriate for the idea?

Where do you see an interesting, textured surface created through the use of a tool?

Where has the nature of a material—for example, its pliability, rigidity, bulk, lightness, or transparency—been used to advantage in creating an original part of the design?